6.0 SURVEY RESULTS

6.1 Introduction

This chapter presents the results of the San Bernardino and Angeles National Forests primary data study for both the property owner and recreators surveys. Although many of the questions were the same in both surveys, there are enough differences so that the results for each will be discussed separately. Aggregate statistics for both surveys can be found in the appendixes in this 'chapter. The results of the telephone survey of non-respondents are also reported.

6.2 Recreator Survey

The first question of the survey asks respondents to rate the tree quality of the six photos enclosed in the color supplement (see the Appendix at the- end of this section). The results were compared to the responses from the pretest group to see if there was consistency in forest quality perception. The majority of respondents to the recreator survey, 62.5%, rated Scene E as excellant, which was consistent with the pretest group. Both groups rated Scene B as good. Variation appeared between the recreator respondents and the pretest group with the remaining photos. Scene A was rated as good by 51% of respondents whereas the majority of people in the pretest group rated it as very good. Scene C was rated as good by respondents and as fair by the pretest group. Scene D was rated as fair by respondents and as good by the pretest group. Scene F was rated as fair by respondents and as poor by the pretest group. The slight discrepancies in perception may be due to the

use of slides for the pretest group as opposed to the color suppement used in the mail survey. The results of both groups may be found in Table 6.1.

Question 2 asked respondents if they were aware of certain factors affecting the quality of the forest. Over 50%. had seen, read, or heard about insects, disease, and drought, while over 90% were aware that fires and air pollution were factors affecting forest quality.

Question 3 asked respondents if they had ever visited the forests in question. Ninety percent responded positively. The 10% that had not visited the forests were told to skip the next section and continue with question 22.

Question 4 asked respondents what types of injury affect their enjoyment in the Angeles and San Bernardino National Forests. People were most adversely affected by dead or dying stands of trees, with 85% responding enjoyment was decreased greatly. Thin stands of trees and trees with discolored needles also decreased enjoyment, but to a lesser degree. This was followed by a moderate decrease in enjoyment from tree stumps and branches with fewer needles. Frequency distributions are presented in the Appendix.

Questions 5 through 8 were designed to extract information about frequency of visitation to the forests. Respondents made an average of 3 trips per year to the Forests. Over 50% of the people made their trips on a weekend, accompanied by an average of 3.26 people.

Questions 9 and 10 centered upon where the respondent travelled on their last trip. Graphs of these regions are presented in Figure 6-1. Question 11 had the respondents rate the forest quality in these regions. The results are summarized in the Appendix.

TABLE 6-1

RECREATORS

SCENE	MEAN[1]	STD DEV.[2]	MED	RATING
A	5.74	1.78	3	good
B	5.38	1.82	3	good
C	5.82	1.90	3	good
D	4.44	2.22	2	fair
E	9.00	1.58	5	excellent
F	4.90	2.72	2	fair

PRETEST GROUP

SCENE	MEAN	STD DEV.	RATING
A	7.43	2.07	very good
B	6.00	1.53	good
C	5.00	1.73	fair
D	5.42	2.07	good
E	8.71	1.38	excellent
F	3.57	1.51	poor

[1]The mean was multiplied by 2 for consistency of scale with the pretest group

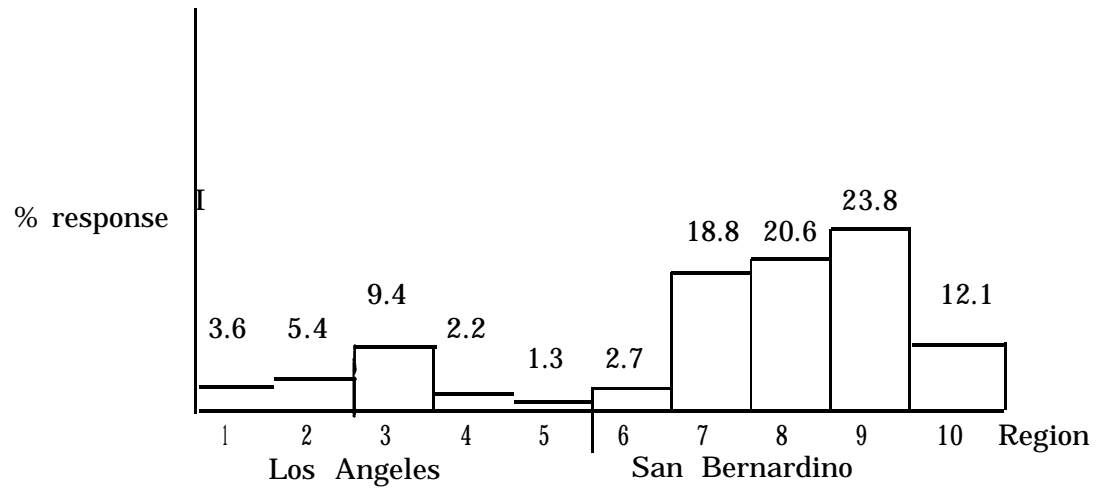[2]The Standard deviation was multiplied by 2 for consistency of scale with the pretest group.

FIGURE 6.1

Question 9: What regions did recreators travel through or spend time in?

% response
rate

								44.5	34.0	
		12.6				3.2		I	24.3	
	10.5									
6.5			3.6	5.3	6.9					

1	2	3	4	5	6	7	8	9	10	Region
	Los Angeles					San Bernardino				
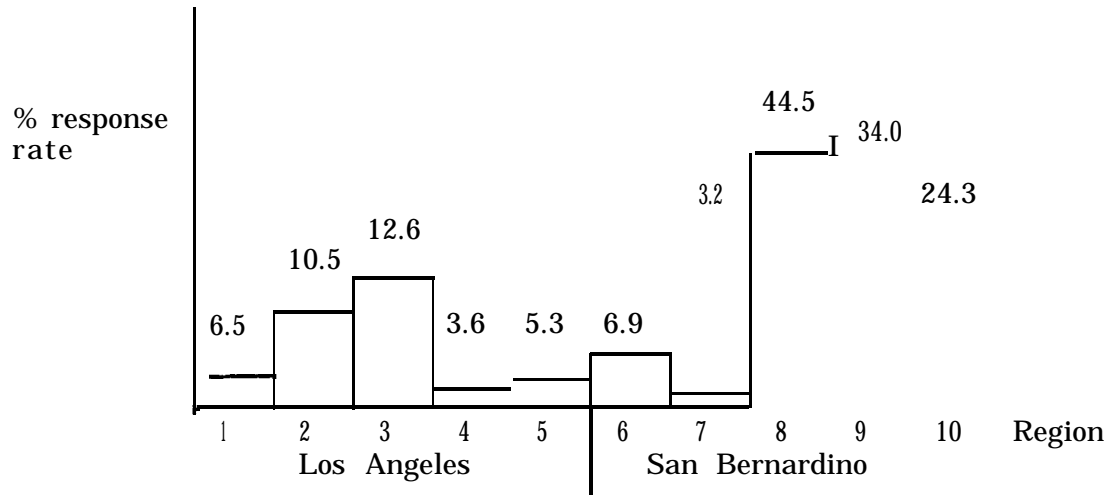
Question 10: In What Region did Recreators spend the most time on their
l a s t   t r i p ?

% response

							18.8	20.6	23.8	
		9.4								12.1
3.6	5.4		2.2	1.3	2.7					

1	2	3	4	5	6	7	8	9	10	Region
	Los Angeles					San Bernardino				

6-4

Question 12 asked respondents how they allocated their time on their last trip. The average respondent spent 15.39 hours driving, 22 hours recreating or participating in outdoor activities, and 19 hours at indoor activities or lodging. The average trip was about 2 days long.

Question 13 asked recreators who stopped in the pine forest to reveal details about the location, duration and activities during their stop. The regions where people stopped the longest are presented in Figure 6-2. The answers to the Recreators' subjective opinions of the area they visited are found in the Appendix.

Questions 14 and 15 asked respondents which recreational activities they participated in while in the National Forests. The majority, 73.5% replied that sightseeing while driving was their main activity, followed by hiking (42%) and shopping/dining (35.1%). See Table 6.2.

Question 16 was a three part question for' respondents who had stayed overnight within the National Forests. From a sample size of 98, the majority spent 2 nights in the Forests (46.9%) in varying kinds of lodging, however, 50% spent under $20.00 on lodging.

Questions 17 through 20 were designed to obtain data on the driving portion of the last trip to the forests from the respondents. The results are summarized in Tables 6-3 and 6-4.

Question 21 asked how a one step decrease in tree quality would affect a respondent's visitation to the Angeles and/or San Bernadino National Forests. Over 50% replied they would make the same number of trips but enjoyment would be less. The 23.3% who responded that they would make fewer itrips to the Forests would reduce their visitationi by around 30%,

FIGURE 6.2

Question 13:   In which Area with Pine Trees did Recreators Stop the Longest?
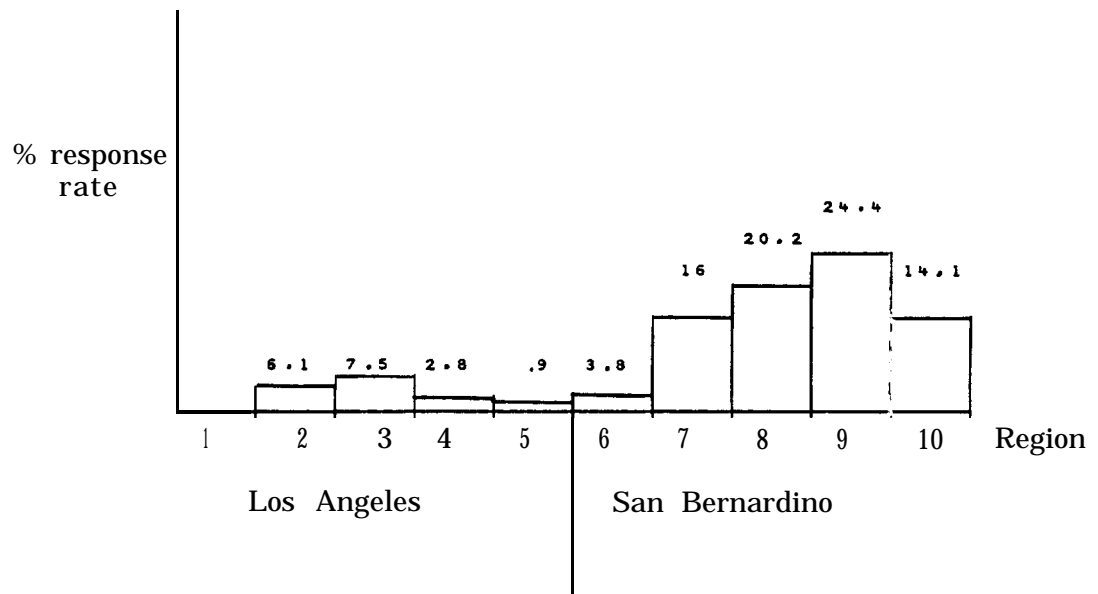
TABLE 6.2

Which Activities Did Recreators Participate In?

Activity	%	Activity	%
Sightseeing	73.5	Off Road Vehicle Use	7.0
Swimming	6.6	Hiking	42.0
Boating	9.5	Skiing	8.6
Camping/Picnicking	29.2	Bicycling	2.1
Fishing	16.0	Recreational Cabin Use	20.1
Hunting	0.0	Shopping/Dining	35.1
Business	12.8'		

TABLE 6.3

<u>Question 17</u>

How Many Miles did Recreators Drive Roundtrip?

<u>Miles</u>	<u>%</u>
0-29	5.1
30-49	9.9
50-74	20.7
75-99	8.6
100-149	25.0
150-199	13.8
Over 200	16.8

<u>Question 18</u>

<u>About</u> how many MPG did Recreators get on their Last Trip?

<u>Miles Per Gallon</u>	<u>%</u>
less than 5	.5
5	1.0
10	10.9
15	24.3
20	26.2
25	19.8
30	8.9
35	6.9
40	1.5
Over 40	0.0

TABLE 6.4

Question 19

How Bothered are Recreators by Traffic Congestion?

Not at all	35.3
Slightly	27.7
Moderately	25.2
Very	7.1
Extremely	4.2

Question 20

How Much Did Recreators Spend on their Last Trip?

$	%
0-10	23.7
11-20	13.1
21-31	13.1
31-50	14.0
51-100	13.1
101-200	11.0
Over 200	4.6

stating they would compensate by taking similar trips to other forests/parklands (53.2%).

Questions 22 through 24 presented the respondent with a situation in which the tree quality in 1) the Angeles and San Bernardino National Forests (question 22), 2) all California parks and forests (question 23) and 3) all forests of the United States (question 24) decrease by one step on the forest quality ladder. Respondents were asked to indicate how much they would be willing to pay for management efforts to offset this decrease. Recreators were willing to pay an average of $49.07 a year to offset a decrease in forest quality in the Angeles and San Bernardino National Forests, with more than 50% attributing existance value as the main reason for doing so. In addition to the money people were willing to pay in question 22, recreators would pay an additional $41.34 each year to prevent the quality of trees from declining in all California parka and forests. Respondents would also pay an average of $38.70 each year to preserve the quality of all forests in the United States. Results are summarized in the appendix and Chapter 8 presents a detailed analysis of these data.

Questions 25 through 33 gathered socio-demographic information about the respondents and their families. These results are summarized in Tables 6-5 and 6-6.

TABLE 6-5

Socio-Economic Characteristics - Recreator

Question 25

Age Total Population	%
0-24	3.8
25-34	23.1
35-44	24.6
45-54	18.9
55-64	12.7
65-74	3.1

Question 26

Sex*

Male	69.1
Female	30.9

* Surveys were completed by heads of households who were predominately male.

Quest ion 27

Days per Year Spent in Outdoor Recreation

mean   70 days

Question 29

Education

0-8 grades	1.9
l-3 years high school	2.7
finished high school	12.1
some college or trade school	37.5
4 or more years college	45.1

TABLE 6-6

Question 30

Employment Status

Employed	67.4
Unemployed	2.6
retired	19.1
full-time homemaker	4.5
student	2.2
others	4.1

Question 31

Occupation

Managerial	22.3
Technical	25.4
Service	13.8
Farm, Forestry, etc.	0.4
Precision	3.1
Labor	14.3
Retired	19.1

Question 32

Income

Under 10,000	7.5%
10,000-19;999	11.6
20,000-24,999	7.9
25,000-34,999	15.3
35,000-49,999	18.7
50,000 +	39.0

I. THE ISSUES

Scientists believe that air pollutants are affecting the quality of the pine trees in the Angeles and San Bernardino National Forests. The photo sheet contained with your questionnaire shows scenes of the Angeles and San Bernardino National Forests. Some of the trees shown in the photos have been damaged by air pollution. The reverse side presents a map of the region.

Q-1 Please refer to the forest quality ladder at the top of the photo sheet. Trees of highest quality are rated as 5 and trees of lowest quality are rated as 1. The sample photos next to the forest quality ladder show trees which are rated as 5 (highest quality) and 2 (lower quality). To help us know what kind of forest you like, please rate the quality of the trees shown in photos A through F using the forest quality ladder. (circle appropriate late number)

		LOWEST QUALITY %									HIGHEST QUALITY		Mean
1.	SCENE A	1	4.5	2	27.3	3	51.0	4	11.0	5	6.1		2.87
2.	SCENE B	1	4.9	2	41.8	3	37.7	4	10.7	5	4.9		2.69
3.	SCENE C	1	6.9		25.1	3	42.5	4	21.1	5	4.5		2.91
4.	SCENE D	1	29.2	2	38.3	3	18.9		8.6	5	4.9		2.22
5.	SCENE E	1	1.6	2	2.0	3	3.6	4	30.4	5	62.5		4.50
6.	SCENE F	1	36.2	2	18.3		17.1	4	21.1	5	7.3		2.45

Q-2 Many factors affect the quality of the forest including insects, disease, drought, forest fires and air pollution. Have you ever SEEN, READ or HEARD about any of these factors affecting the Angeles or San Bernardino National Forests? (circle number)

		NO		YES
1.	INSECTS	1	43.8	2 56.2
2.	DISEASE	1	39.7	2 60.3
3.	DROUGHT	1	28.6	2 71.4
4.	FIRES	1	3.5	2 96.5
5.	AIR POLLUTION	1	9.0	2 91.0

Q-3 Have you ever visited or travelled through an area with pine trees in the Angeles or San Bernardino National Forests? (circle number)

10% 1. NO -Please skip the next section and go on to section III on page 7.
90% 2. YES -Please continue with section II.

II. ABOUT YOUR VISITS TO THE ANGELES AND SAN BERNARDINO NATIONAL FORESTS

Q-4 How do the types of injury listed below affect your enjoyment during a visit to the Angeles or San Bernardino National Forests? (circle number for all that apply)

	NO EFFECT ON ENJOYMENT		DECREASES ENJOYMENT SOMEWHAT		DECREASES ENJOYMENT GREATLY		HAVE NEVER NOTICED	
1. TREES WITH DISCOLORED NEEDLES	1	8.0	2	47.9	3	39.9	4	4.2
2. BRANCHES WITH FEWER NEEDLES	1	8.8	2	57.9	3	28.3	4	5.0
3. DEAD OR DYING STANDS OF TREES	1	2.5	2	9.9	3	85.5	4	2.1
4. TREE STUMPS	1	18.9	2	32.8	3	44.5	4	3.8
5. THIN STANDS OF TREES (fewer trees)	1	6.3	2	44.5	3	45.4	4	3.8

Q-5 How many trips to the pine forests of the Angeles and San Bernardino National Forests do you typically make? (circle closest answer)

1. LESS THAN 1 TRIP EVERY 10 YEARS
2. 1 TRIP EVERY 10 YEARS
3. 1 TRIP EVERY 5 YEARS
4. 1 TRIP EVERY 3 YEARS
5. 1 TRIP EVERY 2 YEARS
6. 1 TRIP PER YEAR
7. 2 TRIPS PER YEAR

10. 3 TRIPS PER YEAR
11. 5 TRIPS PER YEAR
12. 8 TRIPS PER YEAR
13. 10 TRIPS PER YEAR
14. 20 TRIPS PER YEAR
15. 30 TRIPS PER YEAR
16. MORE THAN 30 TRIPS PER YEAR

mean 3 trips per year

Please answer the next questions for the LAST TRIP you made to or through an area with pine trees in the Angeles or San Bernardino National Forests.

Q-6 When was your last trip?

YEAR _____   MONTH _____

mean 1986   mean 5.65

Q-7 Was your trip made on a weekend?

1. NO   40.7
2. YES   59.3

Q-8 How many people accompanied you on your last trip?

_____ PEOPLE

mean 3.26

Q-9   On your map the Angeles and San Bernardino National Forests have been divided into 10 regions. On your last trip to or through the pine forests of the Angeles or San Bernardino National Forest what regions did you travel through or spend time in?   (circle number for all that apply)

REGION NUMBER	1	2	3	4	5	6	7	8	9	10
%	6.5	10.5	12.6	3.6	5.3	6.9	32.0	44.5	34.0	24.3

Q-10   In what region of the pine forest did you spend the most time on your last trip? (circle number)

REGION NUMBER	1	2	3	4	5	6	7	8	9	10
%	3.6	5.4	9.4	2.2	1.3	2.7	18.8	20.6	23.8	12.1

Q-11   Using the forest quality ladder and looking at the map, please rate the quality of the trees you saw in each region you travelled through or spent time in on your last trip? (Circle a rating for all regions you visited on your last trip as indicated in your answer to question 9 above.)

Mean		LOWEST QUALITY %				HIGHEST QUALITY		DON'T KNOW	
		1	2	3	4	5	6		
2.63	1. REGION 1	6.5	10.9	21.7	6.5	0	54.3		
2.97.	2. REGION 2	1.9	13.5	25.0	15.4	0	44.2		
3.48	3. REGION 3	1.9	3.8	26.4	26.4	5.7	35.8		
3.07	4. REGION 4	2.9	2.9	20.6	11.8	0	61.8		
2.71	5. REGION 5	5.3	10.5	21.1	7.9	0	55.3		
2.90	6. REGION 6	5.1	17.9	12.8	7.7	7.7	48.7		
3.30		2.0	11.1	35.4	20.2	9.1	22.2		
3.42	7. REGION 7	1.5	11.8	36.0	24.3	13.2	13.2		
3.71	9. REGION 9	1.9	3.8	26.9	33.7	16.3	17.3		
3.59	10. REGION 10	1.4	6.8	23.0	33.8	13.5	20.3		

Q-12   About how much time did you spend on the following activities on your last trip?

                                                                            mean

		DAYS	
1. DRIVING	_____	DAYS	15.39 HOURS
2. RECREATING OR OTHER OUTDOOR ACTIVITIES	_____	DAYS	22.99 HOURS
3. LODGING OR OTHER INDOOR ACTIVITIES	_____	DAYS	19.3 HOURS
4. TOTAL TIME SPENT ON LAST TRIP	_____	DAYS	43.44 HOURS

3

Q-13   On your last trip to or through the Angeles or San Bernardino National Forests. did you atop anywhere with pine trees? (circle number)

11.7 1. No
87.0 2. Yes

a) In which area with pine trees, did you atop the longest?   (please indicate region number and the city, tow-n or campsite name of the area where you stopped)

REGION NUMBER _____   STOPPING PLACE _____

b) How much time did you spend at your longest atop?

_____ DAYS   _____ HOURS

c) Which step of the forest quality ladder moat closely resembles the appearance of the trees in the area where you stopped longest on your last trip? (circle number)

LOWEST QUALITY				HIGHEST QUALITY	DON'T KNOW
	2	3	4	5	6
% 0.9	7.5	34.1	41.1	11.7	4.7

d) How bothered were you by congestion and crowds at this location on your last trip? (circle number)

NOT AT ALL BOTHERED				EXTREMELY BOTHERED
	2	3	4	5
% 38.1	27.9	17.2	10.7	5.6

e) How would you rate the quality of the following factors at this location?   (circle number for all that apply)

	POOR %				EXCELLENT
1. VIEWS OF MOUNTAINS AND PEAKS	1 2.4	2 9.3	3 23.4	4 33.75	31.2
2. LAKES, STREAMS AND RESERVOIRS	1 11.5	2 12.6	3 26.7	4 26.75	22.5
3. PRESENCE OF WILDLIFE	1 31.3	2 29.7	3 27.1	4 7.35	4.7
4. RECREATION FACILITIES (docks, trails etc.)	1 9.1	2 14.2	3 29.4	4 32.55	14.7
5. AIR QUALITY	1 4.7	2 5.7	3 28.0	4 35.15	26.5
6. FISHING	1 36.4	2 16.4	3 27.9	4 16.45	2.9
7. ACCESS TO RESTAURANTS, STORES AND SERVICES	1 11.9	2 9.2	3 24.9	4 30.35	23.8
8. OTHER (please specify)	1 28.6	2 0	3 28.6	4 23.85	19.0

Q-14   On your last trip, which of the following activities did you
        participate in? (circle number for all that apply)
                                            %
        1. SIGHTSEEING WHILE DRIVING 73.8 8. OFF ROAD VEHICLE USE   7.0
        2. SWIMMING   6.6 9. HIKING   42.0
        3. BOATING   9.5 10. SKIING   8.6
        4. CAMPING/PICNICKING   29.2" 11. BICYCLING   2.1
        5. FISHING   16.0 12. RECREATIONAL CABIN USE   20.1
        6. HUNTING   0 13. SHOPPING/DINING   35.1
        7. BUSINESS   12.8 14. OTHER (please specify)   15.6
                                           _____

Q-15   Which of the above activities would you consider to be the main purpose of
        your last trip?

        _____

Q-16   Did you stay one or more nights within the Angeles or San Bernardino
        National Forests on your last trip?
     %
   60.9 1. NO
   39.1 2. Y E S ⟍▽

        ┌───┐
        │ a) How many nights did you stay? (circle number)   │
        │   │
        │   1   2   3   4   5   6   7   MORE   THAN 7   │
        │ % 27.6 46.9 9.2   8.2   1.0   1.0   3.1   3.1   │
        │   │
        │ b) What type of lodging facility did you use on your last trip?   │
        │   (circle number)   │
        │   %   │
        │   1. HOTEL/MOTEL   15.3   5. SECOND HOME OR COTTAGE 11.2 │
        │   2. MOTOR HOME/CAMPER   17.3   6. STAYED WITH FRIENDS   16.3 │
        │   3. TENT   15.3   7. OTHER (please specify) 7.1 │
        │   4. RENTAL CABIN   17.3   _____ │
        │   │
        │   │
        │ c) How much did you spend on lodging expenses on your last trip?   │
        │   (circle number)   │
        │   %   │
        │   1. $0-19   50.0   4. $75-99   8.0   7. $200-299   4.5   │
        │   2. $20-49   9.1   5. $100-149 6.8   8. $300-400   │
        │   3. $50-74   12.5   6. $150-199 9.1   9. MORE THAN $400 0   │
        └───┘

Q-17   About how many total miles did you drive on your last roundtrip to or
        through the Angeles or San Bernardino National Forests? (circle number)
                                      %
        1. UNDER 20 MILES   1.7 5. 50-74 MILES   20.7   9. 150-174 MILES 8.2
        2. 20-29 MILES   3.4 6. 75-99 MILES   8.6   10. 175-199 MILES 5.6
        3. 30-39 MILES   2.6 7. 100-124 MILES 14.2   11. 200-249 MILES 9.9
        4. 40-49 MILES   7.3 8. 125-149 MILES 10.8   12. OVER 250 MILES 6.9

5

Q-18 About how many miles per gallon did you get while driving on your last trip? (circle closest answer)

LESS THAN 5 MILES PER GALLON	5	10	15	20	25	30	35	40	45	50	MORE THAN 50 MILES PER GALLON	DON'T KNOW
%				24.3		19.8		6.9		0		
.5	1.0	10.9		26.2		8.9		1.5		0	0	0

Q-19 How bothered were you by traffic congestion on your last trip? (circle number)

NOT AT ALL BOTHERED				EXTREMELY BOTHERED
1	2	3	4	5
% 35.3	27.7	25.2	7.1	4.2

Q-20 About how much did you spend on your last trip? (excluding money spent on lodging and on gas, oil and other auto products).

	%					
1. $0-10	23.7	4. $31-40	9.3	7. $101-200	11.0	10. DON'T
2. $11-20	13.1	5. $41-50	4.7	8. $201-400	4.2	KNOW 6.4
3. $21-30	13.1	6. $51-100		9. MORE THAN $400	.4	

Q-21 Think about the quality of the trees in the entire Angeles and San Bernardino National Forests. You may rate some areas of the forest as 5 in quality, some as 3 in quality and so on. Air pollution may cause the quality of the trees in all the regions of the Angeles and San Bernardino National Forests to decrease one step on the forest quality ladder (for example from a level of 4 to a level of 3). How would this change the number of trips that you and members of your household would make to areas with pine trees in the Angeles and San Bernardino National Forests? (circle number)

%
14.5 1. I WOULD MAKE THE SAME NUMBER OF TRIPS WITH NO EFFECT ON MY ENJOYMENT
52.0 2. I WOULD MAKE THE SAME NUMBER OF TRIPS BUT MY ENJOYMENT WOULD BE LESS
23.3 3. I WOULD MAKE FEWER TRIPS
10.1 4. DON'T KNOW

a) About what percent fewer trips would you make? (circle closest number)

LESS THAN 10%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
% 2.9	17.6	11.8	23.5	5.9	27.9	1.5	1.5	4.4	1.5	1.5

b) What would you do as a recreation alternative to your trips to the Angeles and San Bernardino National Forests?

	%
1. RECREATE LESS	1.3
2. TAKE SIMILIAR TRIPS TO OTHER FORESTS/PARKLANDS	53.2
3. PARTICIPATE IN OTHER RECREATION ACTIVITIES	33.8
4. OTHER (please specify)_____	11.7

III. THE VALUE OF FOREST QUALITY TO YOU

Air pollution can injure trees or weaken them so they are more easily damaged by insects, drought or disease. Forest management programs such as tree removal, planting of resistant tree varieties and pest control could be used to offset tree damage from air pollution. One way to fund programs to reduce the effects of air pollution would be to impose higher user fees (such as campground fees) in the forests. Another option would be to increase taxes.

Q-22   Think now about the quality of the trees in the entire Angeles and San Bernardino National Forests. You may rate some areas of the forest as 5 in quality, some as 3 in quality and so on. Would you be willing to pay for management efforts to prevent air pollution from causing a one step decrease in the quality of the trees In all regions of the Angeles and San Bernardino National Forests? (circle number)

%
4.0   No, no reason
23.9 1. NO ————————⟶ | Why? |
72.1 2. YES ——┐
               │
               ▼

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a) What is the MOST your household would be willing to pay EACH YEAR in increased taxes and/or higher user fees for management activities to offset the effects of air pollution and prevent the trees in all regions of the Angeles and San Bernardino National Forests from declining one step on the forest quality ladder? (circle number)

N = 187
ean: $49.07
median: 25.00
std dev.: $75.85

	%											
$1	3.7	$10	24.6	$40	5.9	$150	2.7	$350	.5	$800	0	$2,500 0
$2	1.1	$15	2.7	$50	13.4	$175	0	$400	0	$900	0	$3,000 0
$3	2.7	$20	6.4	$75	.5	$200	1.1	$500	1.1	$1,000	0	$4,000 0
$5	4.8	$25	9.6	$100	9.6	$250	1.1	$600	0	$1,500	0	$5,000 0
$7	1.6	$30	.5	$125	.5	$300	1.6	$700	0	$2,000	0	MORE THAN 0 $5,000

b) Of the amount you entered above, what percentage would you attribute to the following reasons? (write percentage)

median	std dev.	Mean	
0	22.0	21.03%	USE OF FORESTS FOR MYSELF AND FAMILY
.5	25.99	23.73	USE OF FORESTS FOR OTHERS (including future generations)
50	36.27	53.94	PRESERVATION OF THE NATURAL STATE OF FORESTS EVEN IF NO ONE USES THEM
0	9.32	1.23	OTHER (please specify)
		100%	TOTAL

Q-23 Damage to trees by air pollution is not limited to the forests of the Angeles and San Bernardino National Forests. Air pollutants have had effects on trees in other California public forests and parks such as Kings Canyon National Park. These problems may become more severe in the future. Would you be willing to pay for management efforts that would prevent air pollution from causing a one step decrease in the quality of the trees in all California parks and forests? (circle number)

%

6.1   No, no reason

23.8 1. NO ⎯⎯⎯⎯⎯⎯⟶ Why?

70.1 2. YES ⎯⎯�

a) What is the **MOST** your household would be willing to pay **EACH YEAR IN ADDITION** to your answer to question 22 for management activities that would offset the effects of air pollution and prevent the trees in all the California forests from declining one step on the forest quality ladder? (circle number)

N = 174
mean: $41.34
median: 12.5
sta dev.: 65.74

%

	%												
$1	5.7	$10	25.3	$40	4.0	$150	1.1	$350	0	$800	0	$2,500	0
$2	1.1	$15	1.7	$50	11.5	$175	0	$400	0	$900	0	$3,000	0
$3	2.3	$20	4.6	$75	1.7	$200	.6	$500	.6	$1,000	0	$4,000	0
$5	14.9	$25	6.9	$100	10.3	$250	2.3	$600	0	$1,500	0	$5,000	0
$7	.6	$30	3.4	$125	0	$300	1.1	$700	0	$2,000	0	MORE THAN $5,000	0

b) Of the amount you entered above, what percentage would you attribute to the following reasons? (write percentage)

median	std dev.
10	19.58
5	26.94
0	35.57
0	9.59

Mean

16.66%   USE OF FORESTS FOR MYSELF AND FAMILY

24.20   USE OF FORESTS FOR OTHERS (including future generations)

57.80   PRESERVATION OF THE NATURAL STATE OF FORESTS EVEN IF NO ONE USES THEM

1.27   OTHER (please specify) ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

100%   TOTAL

Q-24 Some air pollution tree damage has been found in Acadia and Shenandoah National Parks in the East which may become worse in the future. Think now about the quality of trees in all forests of the United States. Would you be willing to pay for management efforts that would prevent air pollution from causing a one step decrease in the quality of the trees in all forests in the United States? (circle number)

%

9.9   No, no reason

26.9 1. NO   ⟶   Why?

63.2 2. YES

a) What is the **MOST** your household would be willing to pay **EACH YEAR IN ADDITION** to your answers to questions 22 and 23 for management activities that would offset the effects of air pollution and prevent the trees and in all forests of the United States from declining one step on the forest quality ladder? (circle number)

N = 157
mean: $38.70
median: 10.00
std dev: 71.22

$1	7.6	$10	30.6	$40	3.8	$150	1.9	$350	0	$800	0	$2,500	0
$2	4.5	$15	1.3	$50	8.3	$175	0	$400	0	$900	0	$3,000	0
$3	3.8	$20	3.8	$75	.1.3	$200	1.3	$500	1.3	$1,000	0	$4,000	0
$5	10.8	$25	5.7	$100	8.9	$250	.6	$600	0	$1,500	0	$5,000	0
$7	.6	$30	2.5	$125	.6	$300	.6	$700	0	$2,000	0	MORE THAN $5,000	0

b) Of the amount you entered above, what percentage would you attribute to the following reasons? (write percentage)

median	std dev	Mean	
0	19.56	13.60%	USE OF FORESTS FOR MYSELF AND FAMILY
0	28.61	24.49	USE OF FORESTS FOR OTHERS (including future generations)
0	35.94	60.60	PRESERVATION OF THE NATURAL STATE OF FORESTS EVEN IF NO ONE USES THEM
0	9.59	1.26	OTHER (please specify) _____
		100%	TOTAL

IV. ABOUT YOU

Q-25 Your age:_____ YEARS

mean 45.87   median: 44
std dev: 15.37

Q-26 Your sex? (circle number)

%

1. MALE   69.1
2. FEMALE 30.9

Q-27   On how many days per year do you engage in outdoor recreation?

_____ DAYS

mean 70 days   median: 30
                std dev: 87.55

Q-28   Including yourself, how many members in your household are in each age group? (If none, write "0")

	mean	median
_____ UNDER 18 YEARS OF AGE	.78	0
_____ 18 - 64	1.7	2
_____ 65 and OVER	.30	0

Q-29   How much formal education have you completed? (circle number)

%

1. NO FORMAL EDUCATION   1.5   6. TRADE SCHOOL   4.9
2. SOME GRADE SCHOOL   0   7. SOME COLLEGE   32.6
3. COMPLETED GRADE SCHOOL   .4   8. COMPLETED COLLEGE   16.7
4. SOME HIGH SCHOOL   2.7   9. SOME GRADUATE WORK   8.3
5. COMPLETED HIGH SCHOOL   12.1   10. ADVANCED COLLEGE DEGREE 20.1

Q-30   Are you presently: (circle the number of the best answer)

1. EMPLOYED   67.4   4. FULL-TIME HOMEMAKER   4.5
2. UNEMPLOYED   2.6   5. STUDENT   2.2
3. RETIRED   19.1   6. OTHER _____   4.1

Q-31   What is your occupation?

JOB _____

Q-32   What was the approximate annual gross income (before taxes) received last year by you and adult (18 years or older) family members living with you? (circle number)

%

1.   UNDER $5,000   2.1   6. $25,000-29,999   11. $60,000-69,999 8.3
2. $5,000-9,999   5.4   7. $30,000-34,999   8.7   12. $70,000-79,999 5.0
3. $10,000-14,999   3.3   8. $35,000-39,999   5.8   13. $80,000-89,999
4. $15,000-19,999   8.3   9. $40,000-49,999   12.9   14. $90,000-100,000 2.1
5. $20,000-24,999   7.9   10. $50,000-59,999   10.4   15. MORE THAN $100,000 7.1

Q-33   About how many total hours per week do you and other adult members of your household spend working?

_____ HOURS

mean 62 hours   median: 50
                 std dev: 60.35

10

Is there anything we may have overlooked?   Please use this space for any additional comments you would like to make concerning the quality of trees in the Angeles and San Bernardino National Forests,

Your contribution to this effort is very greatly appreciated. If you would like a summary of results, please print your name and address on the back of the return envelope (NOT on this questionnaire).   We will see that you receive it.

6.3 <u>Property Survey</u>

The first question of the survey asks respondents to rate the tree quality of the six photos enclosed in the color supplement (see the appendix at the end of this section). The results were compared to the responses from the pretest group to see if there was consistency in forest quality perception. The majority of respondents to the property survey 68.3%, rated scene E as excellent, which was consistent with the pretest group. Both groups rated Scene B as good. Variation appeared between the property owner respondents and the pretest group in the remaining photos. Scene A was rated as good by 53.2% of respondents whereas the majority of people in the pretest group rated it as very good. Scene C was rated as good by the property owners and as fair by the pretest group. Scene D was rated as poor by property owners and as good by the pretest group. Scene F was rated as fair by the property owners and as poor by the pretest group. The discrepencies in perception may be due to the use of slides for the pretest group as opposed to the color supplement used in the mail survey. The results of both groups may be found in Table 6-7.

Question 2 asked respondents if they were aware of certain factors affecting the quality of the forest. Over 85% of respondents had seen, read or heard about insects, fires, air pollution and disease, while 66.1% were aware of drought.

Question 3 asked respondents what type of injury affects their enjoyment in the Angeles and San Bernardino National Forests. People were most adversely affected by dead or dying stands of trees, with 86.3%

6-13

TABLE 6.7
PROPERTY OWNERS

Scene	Mean[1]	Std. Dev.[2]	Median	Rating
A	5.62	1.64	3	good
B	5.36	1.52	3	good
C	5.86	1.62	3	good
D	3.92	1.82	2	poor
E	9.16	1.42	5	excellent
F	4.40	2.50	2	fair

PRETEST GROUP

Scene	Mean	Std. Dev.	Rating
A	7.43	2.07	Very Good
B	6.00	1.53	good
C	5.00	1.73	fair
D	5.42	2.07	good
E	8.71	1.38	e x c e l l e n t
F	3.57	1.51	poor

[1] The mean was a multipled by 2 for consistency of scale with the pretest group.

[2] The standard deviation was multiplied by 2 for consistency of scale with the pretest group.

responding enjoyment was decreased greatly. Trees with discolored needles decreased enjoyment greatly in 57.2% of respondents. This was followed by branches with fewer needles, thin stands of trees, and tree stumps, consecutively. Frequency distributions are presented in the appendix to this section.

Questions 4 through 7 were designed to locate, as precisely as possible, the respondents residence. The results are presented in Figure 6-3 and Table 6-8.

Question 8 obtains the respondents perception of the quality of trees on their property. Over half of the respondents felt the trees in their neighborhood were better than average in quality (see appendix).

Questions 9 through 17 and question 19 ask the respondent for a variety of information about the size and type of residence they own. These questions will be used to help form a profile of the mountain communities for the property value analysis. The results are summarized in Table 6-9.

In question 20, respondents rate the quality of various factors which may contribute to their enjoyment of their mountain residence. Property owners rated views of mountains and peaks as the best factor around their residence, with 64.1% replying it was excellent. Other important factors include lakes, streams and reservoirs; quality of schools; and access to restaurants, stores and services, respectively (see appendix).

Mountain homes were the primary residence for 95.1% of respondents in question 21.

Most of the questions in Section Three are taken directly from Section Two of the Recreators Survey. Questions 22 through 25 were designed to

FIGURE 6-3

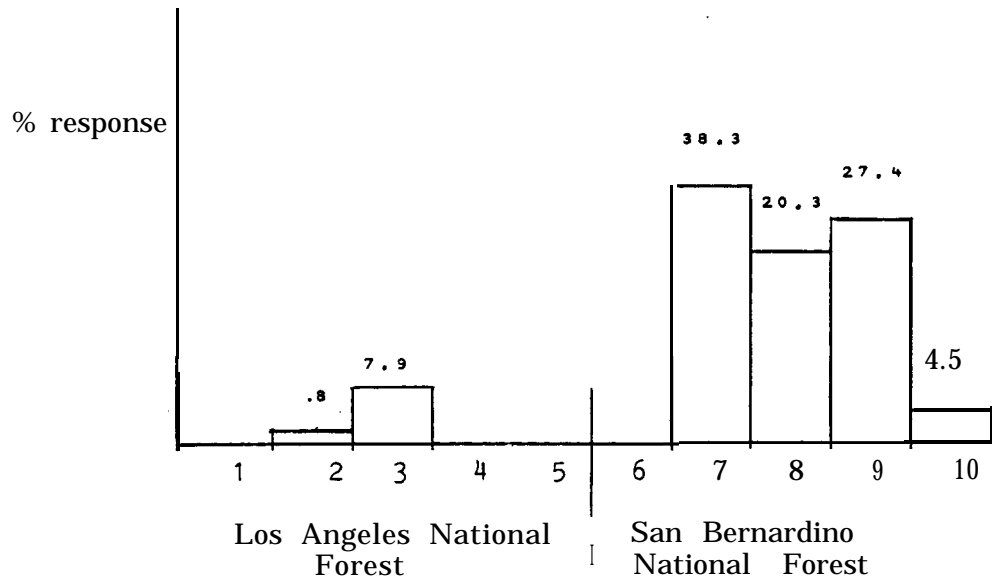Question 4:   In which region is your residence located?

TABLE 6.8

<u>Question 5</u>

Which Town or City is Your Residence Closest to?

<u>Town</u>	<u>Percent</u>
Angeles Oaks	1.9
Arrowbear Lake	1.2
Big Bear City	11.2
Big Bear Lake	14.2
Blue Jay	3.1
Cedar Glen	1.5
Cedar Pine Park	.4
Crestline	17.7
Forest Falls	2.3
Green Valley Lake	1.5
Lake Arrowhead	14.6
Lake Gregory	1.9
Moonridge	.4
Running Spring	11.2
San Bernardino	1.2
Skyforest	.8
Sugar loaf	1.9
Twin Peaks	3.5
Wrightwood	8.5
Other	1.2

TABLE 6-9

Housing Characteristics - Property Survey

	Mean
Year home was purchased	1976
Month home was purchased	7.12
Purchase Price of home	$61,491
Purchase Price of home adjusted by CPE	
Mean Square ft.	1713.18
% with a swimming pool	7.1%
% with a fireplace	95.1
% with a scenic view	78.6
% with a hot tub	15.8
% with a lakefront property	4.5
% with exercise facilities	18.0
Avg. # of bathrooms	1.95
Avg. # of bedrooms	2.82
Year home was built	1966.06
% located near a stream, lake or creek	35.4
Mean Dimensions of the lot in feet	
length	134.22
width	81.53
Type of Residents	
% detached single family home	94.3
% townhouse	.4
% mobile home or trailor	2.7
% condominium	1.1
% apartment	1.5

extract information about frequency of visitation to second homes in the forests. From a sample size of 10, respondents made an average of 27.8 trips to their residence in the last year. Seventy percent made their trip on a weekend, accompanied by 2.3 people.

Question 26 asked respondents how they allocated their time on their last trip. Half of the respondents spent over 3 hours driving and 3 hours recreating or doing other outdoor activities and 10 hours at indoor activities or lodging. The average trip was 2 days long.

Questions 27 through 30 were designed to obtain data on the driving portion of the last trip to their secondary residence in the forests. The results are summarized in Tables 6-10 and 6-11.

Question 31 asked respondents how a one step decrease on the forest quality ladder would change the number of trips that they would make to their second home in the National Forests. Eighty percent replied they would make the same number of trips but enjoyment would be less. The respondents would not make fewer trips, therefore there was not a sample size for questions 31a and 31b (see appendix).

Question 32 asks respondents where their non-mountain resident is located.

Questions 35 through 38 present the respondent with a situation in which the tree quality in 1) the neighborhood of their residence (question 35) 2) the Angeles and San Bernardino National Forests (question 36) 3) all California parks and forests (question 37) and 4) all forests of the United States (question 38) decrease by one step on the forest quality ladder. The respondents were asked to indicate how much they would be willing to pay for management efforts to offset this decrease. Property owners were willing to pay an average of $99.03 each year to offset the decrease of

TABLE 6-10

Question 27

How Many Miles did you Drive Round Trip?

Miles	%
0-29	0
30-49	9.1
50-74	0
75-99	0
100-199	27.3
Over 200	0

Question 28

 About How Many Miles Per Gallon did Property Owners get on the Last Trip?

Miles Per Gallon	%
less than 5	0
5	0
10	30.0
15	10
20	10
25	30
30	10
35	0
40	10
Over 40	0

Question 29

How bothered are Property, Owners by Traffic Congestion?

Not at all	18.2%
Slightly	36.4
Moderately	18.2
Very	18.2
Extremely	9.1

TABLE 6-11

Question 30

How Much did you Spend on your Last Trip?

$	%
0- 10	18.2
11- 20	18.2
21- 30	9.1
31- 50	18.2
51- 100	9.1
101-200	18.2
Over 200	0

forest quality in the Angeles and San Bernardino National Forests, with the majority attributing existance value as the main reason for doing so. In addition to the money people were willing to pay in question 35, property owners would pay an additional $75.07 a year to prevent the quality of trees from declining in all California parks and forests. Respondents would also pay an average of $51.15 a year in addition to the previous amounts to preserve the quality of all forests in the United States. Results are summarized in the appendix.

Questions 39 through 47 gathered socio-demographic information about the respondents and their families. These results are gathered in Tables 6-12 and 6-13.

TABLE 6-12

Socio-Economic Characteristics - Property

<u>Question 39</u>

<u>Total Population</u>	<u>%</u>
0-24	1.2
25-34	17.8
35-44	26.6
45-54	18.1
55-64	18.6
65-74	15.7
75+	2.0
mean	48.66

<u>Question 40</u>

<u>Sex</u>*

Male	71.4
Female	28.6

*surveys were completed by heads of households who were predominately male.

<u>Question 41</u>

How many days/yr do you engage in outdoor recreation?

Mean	118.4
Median	65.

<u>Question 42</u>

<u>Age</u>

Age 1	Mean	1.0
Age 2		1.76
Age 3		.48

TABLE 6-13

<u>Question 43</u>

<u>E d u c a t i o n</u>	<u>%</u>
0-8	.8
1-3	2.6
finished high school	11.7
some college or trade school	43.0
4 or more years of college	41.9

<u>Question 44</u>

<u>Employment Status</u>	<u>%</u>
Employed	66.2
Unemployed	1.5
retired	26.7
Pull-time homemaker	3.4
student	.4
other	1.9

<u>Question 45</u>

<u>Occupation</u>	<u>%</u>
Managerial	26.8
Technical	17.9
Service	12.8
Farm, Forestry, etc.	0.4
Precision	4.3
Labor	7.2
Retired	26.7

<u>Question 46</u>

<u>Income</u>	<u>%</u>
Under 10,000	3.7
10,000-19,999	11.6
20,000-24,999	8.7
25,000-34,999	19.0
35,000-49,999	24.8
50,000+	31.9

<u>Question 47</u>

<u>Numbers of hours spent working</u>

Mean	50.49

APPENDIX TO
SECTION 6.3:
PROPERTY OWNER SURVEY

I. THE ISSUES

Scientists believe that air pollutants are affecting the quality of the pine trees
in the Angeles and San Bernardino National Forests. The photo sheet contained with
your questionnaire shows scenes of the Angeles and San Bernardino National Forests.
Some of the trees shown in the photos have been damaged by air pollution. The
reverse side presents a map of the region.

Q-1 Please refer to the forest quality ladder at the top of the photo sheet.
Trees of highest quality are rated as 5 and trees of lowest quality are
rated as 1. The sample photos next to the forest quality ladder show trees
which are rated as 5 (highest quality) and 2 (lower quality). To help us
know what kind of forest you like, please rate the quality of the trees
shown in photos A through F using the forest quality ladder. (circle
appropriate number)

	LOWEST QUALITY								HIGHEST QUALITY			Mean
		%										
1. SCENE A	1	4.4	2	28.2	3	53.2	4	10.7	5	3.6		2.81
2. SCENE B	1	4.8	2	35.2		47.6		12.0:	5	0.4		2.68
3. SCENE C	1	2.4	2	27.3	3	46.6		22.1	5	1.6		2.93
4. SCENE D	1	34.1.	2	42.9	3	16.7	4	5.2	5	1.2		1.96
5. SCENE E	1	0	2	2.4	3	5.6		23.8	5	68.3		4.58
6. SCENE F	1	38.8	2	26.8	3	16.0	4	12.0	5	6.4		2.20

Q-2 Many factors affect the quality of the forest including insects, disease,
drought, forest fires and air pollution. Have you ever SEEN, READ or HEARD
about any of these factors affecting the Angeles or San Bernardino National
Forests? (circle number)

		NO		YES
			%	
1.	INSECTS	1	8.8	2 91.2
2.	DISEASE	1	12.3	2 87.7
3.	DROUGHT	1	33.9	2 66.1
4.	FIRES	1	5.6	2 94.4
5.	AIR POLLUTION	1	6.9	2 93.1

Q-3 How do the types of injury listed below affect your enjoyment of the Angeles
or San Bernardino National Forests? (circle number for all that apply)

	NO EFFECT ON ENJOYMENT,		DECREASES ENJOYMENT SONEWHAT		DECREASES ENJOYMENT GREATLY		HAVE NEVER NOTICED	
		%						
1. TREES WITH DISCOLORED NEEDLES	1	4.9	2	37.5	3	57.2	4	0.4
2. BRANCHES WITH FEWER NEEDLES	1	5.0	2	51.3	3	42.5	4	1.1
3. DEAD OR DYING STANDS OF TREES	1	1.1	2	10.3	3	86.3	4	2.3
4. TREE STUMPS	1	17.8	2	41.5	3	37.9	4	2.8
5. THIN STANDS OF TREES	1	10.7	2	44.4	3	43.7	4	1.1

(fewer trees)

1

II. ABOUT YOUR HOME IN THE MOUNTAINS

In order to learn more about how you Value the quality of the Angeles and San Bernardino National Forests we need some information about your living experience in the mountains. Many factors, including the quality of the trees in your neighborhood, may be important in determining rents and property values in your community.

Q-4   Please refer to your map/photo sheet. The Angeles and San Bernardino National Forests have been divided into 10 regions. In which region is your residence located?

REGION NUMBER _____

Q-5   Which town or city is your residence closest to?

CITY OR TOWN NAME _____

Q-6   About how many miles is your residence from the town you indicated in question 5? (if in the town, enter "O")

_____ MILES

std. dev.: 19.53 miles

Q-7   'What direction does your residence lie from the center of the town you indicated in question 5? (circle number)

1. NORTH 10.3% 3. WEST 13.4 5. SOUTH 4.6 7. EAST 25.3 9. AT CENTER
2. NORTHWEST 10.7 4. SOUTHWEST 9.6 6. SOUTHEAST 10.3 8. NORTHEAST 12.3 OF TOWN

Q-8   Are there pine trees on or near your property? (circle number)

%
2.0 1. NO
97.6 2. YES

Please look at the forest quality ladder on the photo sheet. How would **you** rate the quality of the trees in the neighborhood of your residence? (circle number)

LOWEST QUALITY				HIGHEST QUALITY	DON'T KNOW
1	2	3	4	5	6
0.4	2.7	23.9	49.8	22.0	0.8

Q-9　　Please check the space next to the feature(s) your residence contains.
(check all that apply)

%

_7.1_ SWIMMING POOL OR ACCESS TO ONE
_95.1_ FIREPLACE/WOOD BURNING STOVE
_78.6_ SCENIC VIEW
_1 5 . 8_ HOT TUB OR ACCESS TO ONE
　　　　LAKEFRONT PROPERTY
_1 8 . 0_ EXERCISE FACILITIES OR ACCESS TO FACILITIES

Q-10　　About how many square feet does your home have? ＿＿＿＿＿SQUARE FEET

mean:1713.18
std. dev.: 1398.52　　median : 1500

Q-11　　How many bathrooms does your home have? ＿＿＿＿＿＿ BATHROOMS

mean: 1.95
std. dev.: .71　　median: 2

Q-12　　How many bedrooms does your home have?＿＿＿＿＿＿BEDROOMS

mean: 2.82
std. dev.: .92　　median: 3

Q-l3　　Approximately when was your home originally built?　YEAR＿＿＿

mean : 1966.06
std. dev.: 15.9　　median: 1 9 7 0

Q-14　　DO you own this residence? (circle number)

%

18.4　1.　NO ⟶ | How much is your monthly rent payment $ |　$476.61 : :
81.6　2.　YES ↴　　　　　　　　　　　　　　　　　　　　242.82 :
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　N = 51

a) What year and month did you purchase your residence?

YEAR ＿＿＿＿＿　　MONTH ＿＿＿＿＿
　　mean : 1976　　mean : 7.12
b) What was the purchase price of your residence?

$61,491 (mean)　　std.dev.: $52,888.9
　　median: $50,000

Q-15 What type of residence do you have in the Angeles or San Bernardino National Forest? (circle number)

%

1. DETACHED SINGLE FAMILY HOME	94.3
2. TOWNHOUSE	0.4
3. MOBILE HOME OR TRAILOR	2.7
4. CONDOMINIUM	1.1
5. APARTMENT	1.5

Q-16 What are the approximate dimensions of the lot on which this residence sits?

LENGTH_____   WIDTH_____   (or ACRES _____)

mean: 134.22 ft   mean: 81.53 ft   mean: 10.2
median: 108.0   median: 75.0   median: 1.0

Q-17 Do you ever rent your mountain residence to others? (circle number)

96.5 1. NO

3.5 2. YES→

DAYS RENTED PER YEAR	365 (mean)
RENT COLLECTED PER YEAR $	37,700 (mean)

Q-18 Do you regularly visit areas with pine trees in the Angeles or San Bernardino National Forests away from the immediate area of your mountain residence? (circle number)

%

40.3 1. NO

59.7 2. YES ⟶

Please fill in the following information.

%	NAME OF AREA (Top 4)	LOCATION OF AREA (region number)	NUMBER OF VISITS PER YEAR
24.2	a) Big Bear Lake	6	
16.8	b) other	27	
16.1	c) Lake Arrowhead	17	
7.4	d) Lake Silverwood	19	

Q-19 Is your residence located next to a stream, lake or creek? (circle number)

%

64.6 1. NO

35.4 2. YES ⟶

What is the name of the stream, lake or creek?

NAME

Q-20   How would you rate the following factors in the immediate area (within a 15 minute drive) around your residence? (circle number for all that apply)

	POOR								EXCELLENT	
	1	%	2		3		4		5	
1. VIEWS OF MOUNTAINS AND PEAKS	1	1.1	2	1.1	3	8.0	4	25.6	5	64.1
2. LAKES, STREAMS AND RESERVOIRS	1	5.5	2	8.3	3	14.6	4	23.6	5	48.0
3. PRESENCE OF LOCAL WILDLIFE	1	6.1	2	14.6	3	29.5	4	31.0	5	18.8
4. RECREATION FACILITIES (docks, trails etc.)	1	4.0	2	8.7	3	19.0	4	34.5	5	33.7
5. AIR QUALITY	1	2.0	2	9.0	3	25.4	4	39.1	5	24.7
6. LOCAL FISHING	1	4.1	2	11.1	3	29.2	4	31.7	5	23.9
7. ACCESS TO RESTAURANTS, STORES AND SERVICES	1	2.3	2	3.9	3	17.1	4	35.4	5	41.2
8. QUALITY OF SCHOOLS	1	2.0	2	3.6	3	14.2	4	37.7	5	42.5
9. OTHER (please specify)_____	1	8.1	2	2.7	3	5.4	4	16.2	5	67.6

Q-21   Is your mountain home your primary residence? (circle number)

%
95.1   1.   YES -Please skip to SECTION IV on page 8.
4.5   2.   NO -Please continue with SECTION III.

III.   ABOUT YOUR SECOND HOME IN THE ANGELES OR SAN BERNARDINO NATIONAL FORESTS

Q-22   About how many trips did you make to this residence over the last year?

N = 10   _____ TRIPS
         mean: 27.8
         median: 9   std. dev.:   44.67

Please answer the next questions for the LAST TRIP you made to your second home in the Angeles or San Bernardino National Forests.

Q-23   When was your last trip?

YEAR_____   MONTH _____
   mean: 1987   mean: 6.2

Q-24   Was your trip made on a weekend?
                    %
1.   NO   30
2.   YES 70

Q-25   How many people accompanied you on your last trip?

         _____ PEOPLE
         mean: 2.3
         median: 1.0   std. dev.:   2.95

5

Q-26   About how much time did you spend on the following activities on your last trip?

				mean	median
1.	DRIVING	____ DAYS		20 HOURS	3
2.	RECREATING OR OTHER OUTDOOR ACTIVITIES	____ DAYS		11.5 HOURS	3
3.	LODGING OR OTHER INDOOR ACTIVITIES	____ DAYS		36.4 HOURS	10
4.	**TOTAL TIME SPENT ON LAST TRIP**	____ DAYS		46.75 HOURS	33

Q-27   About how many total miles did you drive on your last roundtrip to your second home in the Angeles or San Bernardino National Forests? (circle number)

%

		%			%			%
1.	UNDER 20 MILES	0	5.	50-74 MILES	0	9.	150-174 MILES	9.1
2.	20-29 MILES	0	6.	75-99 MILES	0	10.	175-199 MILES	18.2
3.	30-39 MILES	9.1	7.	l00-124 MILES	54.5	11.	200-249 MILES	0
4.	40-49 MILES	0	8.	125-149 MILES	9.1	12.	OVER 250 MILES	0

Q-28   About how many miles per gallon did you get while driving on your last roundtrip to your second home? (circle closest response)

LESS THAN 5 MILES PER GALLON	5	10	15	20	25	30	35	40	45	50	MORE THAN 50 MILES PER GALLON	DON'T KNOW
% 0	0	30.0	10	20	30	10	0	10	0	0	0	0

Q-29   How bothered were you by traffic congestion on your last trip to your second home? (circle number)

NOT AT ALL BOTHERED				EXTREMELY BOTHERED
1	2	3	4	5
18.2	36.2	18.2	18.2	9.1

%

Q-30   About how much did you spend on your last trip? (excluding money spent on lodging and on gas, oil and other auto products).

%

		%			%			%			%
1.	$0-10	18.2	4.	$31-40	18.2	7.	$101-200	18.2	10.	DON'T KNOW	0
2.	$11-20	18.2	5.	$41-50	0	8.	$201-400	0			
3.	$21-30	9.1	6.	$51-100	9.1	9.	MORE THAN $400	0			

Q-31   Please refer again to your map/photo sheet. Think about the quality of the trees in the area of your residence. You may rate some areas of the forest as 5 in quality, some as 3 in quality and so on. Air pollution may cause the quality of the trees in the area of your residence to decrease by one step on the forest quality ladder (for example from a level of 4 to a level of 3). How would this change the number of trips you and members of your household make to your second home in the National Forests in a typical year? (circle number)

10%   1.   I WOULD MAKE THE SAME NUMBER OF TRIPS WITH NO EFFECT ON MY ENJOYMENT.
8-0   2.   I WOULD MAKE THE SAME NUMBER OF TRIPS BUT MY ENJOYMENT WOULD BE LESS.
0   3.   I WOULD MAKE FEWER TRIPS
10   4.   DON'T KNOW

> a) About what percent fewer trips would you make in a typical year? (circle number)
>
>   LESS THAN 10% 20% 30% 40%   50% 60% 70% 80% 90% 100%
>   10%
>
> b) What would you do as a recreation alternative to your trips to the Angeles and San Bernardino National Forests?
>
>   1.   RECREATE LESS
>   2.   TAKE SIMILIAR TRIPS TO OTHER FORESTS/PARKLANDS
>   3.   PARTICIPATE IN OTHER RECREATION ACTIVITIES
>   4.   OTHER (please specify) _____

Q-32   In what city is your primary (non-mountain) residence?

a) CITY _____   b) ZIP CODE _____

Q-33   What is the monthly payment and size of your non-mountain residence?

a) $_____ PER MONTH   b) _____ SQUARE FEET
   mean: $667.11   mean: 1400 sq ft
   median: 575.   median: 1400
   std. dev.: 309.42   std. dev.: 865.76

Q-34   How many days per year does your household spend:

	mean		median
a) AT YOUR PRIMARY RESIDENCE.	274.72	DAYS	297.5
b) AT YOUR MOUNTAIN RESIDENCE.	101	DAYS	32.5
c) AT OTHER LOCATIONS.	41.91	DAYS	20
TOTAL	365	DAYS	

IV. THE VALUE OF FOREST QUALITY TO YOU

Air pollution can injure trees or weaken them so the are more easily damaged by insects, drought or disease. Forest management programs such as tree removal, planting of resistant tree varieties and pest control could be used to offset tree damage from air pollution. One way to fund programs to reduce the effects of air pollution would be to impose higher user fees (such as campground fees) in the forests. Another option would be to increase taxes.

Q-35   Think now about the quality of the trees in he neighborhood of your residence in the Angeles or San Bernardino National Forest. You may rate some areas of the forest as 5 in quality, some as 3 in quality and so on. Would you be willing to pay for management efforts to prevent air pollution from causing a one step decrease in the quality of the trees in the neighborhood of your residence? (circle number)

%

3.6   **No, no reason**

30.8 1. NO ⟶ Why?

65.6 2. YES

N = 178
mean: $99.0
median : $50.00
std dev.:
$141.50

a) What is the MOST your household would be willing to pay EACH YEAR in increased taxes for management activities to offset the effects of air pollution and prevent the trees only in the neighborhood of your residence from declining one step on the forest quality ladder? (circle number)

%

$1	5.1	$10	9.0	$40	5.1	$150	7.9	$350	.6	$800	0	$2,500	0
$2	3.9	$15	2.2	$50	16.3	$175	.6	$400	0	$900	0	$3,000	0
$3	0	$20	4.5	$75	1.7	$200	3.9	$500	3.4	$1,000	1.1	$4,000	0
$5	0	$25	6.2	$100	16.3	$250	2.2	$600	0	$1,500	0	$5,000	0
$7	1.1	$30	3.4	$125	3.9	$300	1.7	$70	0	$2,000	0	MORE THAN $5,000	0

b) Of the amount you entered above, what pe centage would you attribute to the following reasons? (write percentage)

median	std dev		Mean
25	21.01		27.78% USE OF FORESTS FOR MYSELF AND FAMILY
25	17.87		23.02 USE OF FORESTS FOR OTHERS (including future generations)
50	30.89		48.33 PRESERVATiON OF THE NATURAL STATE OF FORESTS EVEN IF NO ONE USES THEM
0	3.85		.81 OTHER (please specify) _____

100%   TOTAL

Q-36 Think now about the quality of the trees in the entire Angeles and San Bernardino National Forests. You may rate some areas of the forest as 5 in quality some as 3 in quality and so on. Would you be willing to pay for management efforts to prevent air pollution from causing a one step decrease in the quality of the trees in all regions of the Angeles and San Bernardino National Forests? (circle number)

%

4.8   No, no reason

32.2   1. NO ⟶ Why?

63.0   2. YES

a) What is the MOST your household would be willing to pay EACH YEAR IN ADDITION to your answer to question 35 for management activities to offset the effects of air pollution and prevent the trees in all regions of the Angeles and San Bernardino National Forests from declining one step on the forest quality ladder? (circle number)

$1	4.4	$10	13.2	$40	3.1	$150	3.1	$350	0	$800	0	$2,500	0
$2	0	$15	2.5	$50	17.6	$175	0	$400	0	$900	0	$3,000	0
$3	0	$20	3.8	$75	1.9	$200	3.1	$500	3.1	$1,000	.6	$4,000	0
$5	8.2	$25	10.7	$100	13.8	$250	1.3	$600	0	$1,500	0	$5,000	0
$7	1.3	$30	3.1	$125	3.8	$300	.6	$700	0	$2,000	0	MORE THAN $5,000	0

= 159
mean: $75.07
median: 40.00
std. dev.: $121.04

b) Of the amount you entered above, what percentage would you attribute to the following reasons? (write percentage)

median	std dev.	Mean	
0	20.25	20.94%	USE OF FORESTS FOR MYSELF AND FAMILY
25	20.16	23.96	USE OF FORESTS FOR OTHERS (including future generations)
0	32.43	53.57	PRESERVATION OF THE NATURAL STATE OF FORESTS EVEN IF NO ONE USES THEM
0	10.30	1.45	OTHER (please specify)

100%   TOTAL

Q-37 Damage to trees by air pollution is not limited to the forests of the Angeles and San Bernardino National Forests. Air pollutants have had effects on trees in other California public forests and parks such as Kings Canyon National Park. These problems may become more severe in the future. Would you be willing to pay for management efforts that would prevent air pollution from causing a one step decrease in the quality of the trees in all California parks and forests? (circle number)

%

9.0   No, no reason

34.2   1.   N O ---------   Why?

56.8   2.   YES

a) What is the MOST your household would be willing to pay EACH YEAR IN ADDITION to your answer to questions 35 and 36 for management activities to offset the effects of air pollution and prevent the trees in all the California forests from declining one step on the forest quality ladder? (circle number)

N = 141
mean: $51.15
median: 25.00
std. dev: $103.35

%

$1	7.8	$10	19.9	$40	2.8	$150	2.1	$350	0	$800	0	$2,500	0
$2	2.1	$15	2.8	$5O	15.6	$175	0	$400	0	$900	0	$3,000	0
$3	.7	$20	4.3	$75	l.4	$200	2.1	$500	.7	$1,000	.7	$4,000	0
$5	7.8	$25	2.8	$100	5.7	$250	2.1	$600	0	$1,500	0	$5,000	0
$7	.7	$30	5.0	$125	2.8	$300	0	$700	0	$2,000	0	MORE THAN $5,000	0

b) Of the amount you entered above, what percentage would you attribute to the following reasons? (write percentage)

median	std dev		Mean	
5	19.46		18.63%	USE OF FORESTS FOR MYSELF AND FAMILY
25	22.46		22.70	USE OF FORESTS FOR OTHERS (including future generations)
50	33.73		58.03	PRESERVATION OF THE NATURAL STATE OF FORESTS EVEN IF NO ONE USES THEM
0	3.31		.55	OTHER (please specify) _____
			100%	TOTAL

Q-38   Some air pollution tree damage has been found in Acadia and Shenandoah National Parks in the East which may become worse in the future. Think now about the quality of trees in all forests of the United States. Would you be willing to pay for management efforts that would prevent air pollution Prom causing a one step decrease in the quality of the trees in all forests in the United States? (circle number)

%

11.6   No, no reason

35.6   1.   NO --------- W h y ?

52.9   2.   YES

N = 129

mean: $47.74

median: 20.00

std. dev.: $106.74

a) What is the **MOST** your household would be willing to pay **EACH YEAR IN ADDITION** to your answers to questions 35, 36 and 37 for management activities that would offset the effects of air pollution and prevent the trees and in all forests of the United States from declining one step on the forest quality ladder? (circle number)

$1	13.2	$10	14.0	$40	2.3	$150		$350	0	$800	0	$2,500	0
$2	3.1	$15	3.1	$50	9.3	$175		$400	0	$900	0	$3,000	0
$3	0	$20	7.8	$75	.8	$200		$500	.8	$1,000	.8	$4,000	0
$5	12.4	$25	10.9	$100	2.3	$250		$600	0	$1,500	0	$5,000	0
$7	1.6	$30	4.7	$125	0	$300		$700	0	$2,000	0	MORE THAN $5,000	0

b) Of the amount you entered above, what percentage would you attribute to the following reasons? (write percentage)

median	std dev	Mean	
5	17.78	14.47%	USE OF FORESTS FOR MYSELF AND FAMILY
25	24.74	25.37	USE OF FORESTS FOR OTHERS (including future generations)
50	33.22	59.55	PRESERVATION OF THE NATURAL STATE OF FORESTS EVEN IF NO ONE USES THEM
0	3.31	.55	OTHER (please specify) _____
		100%	TOTAL

V.   ABOUT YOU

Q-39   Your age: _____ YEARS

mean : 48.66   median: 47.0   std. dev.: 14.23

Q-40   Your sex? (circle number)

%

1. MALE   71.4

2. FEMALE   28.6

11

Q-41   On how many days per year do you engage in outdoor recreation?

_____ DAYS
mean: 118.4 days
median: 65   std. dev.: 116.17

Q-42   Including yourself, how many members in your household are in each age group? (If none, write "0")

	mean	median
_____ UNDER 18 YEARS OF AGE	.99	1
_____ 18 - 64	1.76	2
_____ 65 and OVER	.48	0

Q-43   How much formal education have you completed? (circle number)

	%			%
1. NO FORMAL EDUCATION	0	6. TRADE SCHOOL		6.8
2. SOME GRADE SCHOOL	.4	7. SOME COLLEGE		36.2
3. COMPLETED GRADE SCHOOL	.4	8. COMPLETED COLLEGE		17.7
4. SOME HIGH SCHOOL	2.6	9. SOME GRADUATE WORK		10.6
5. COMPLETED HIGH SCHOOL	11.7	10. ADVANCED COLLEGE DEGREE		13.6

Q-44   Are you presently: (circle the number of the best answer)

	%			%
1. EMPLOYED	66.2	4. FULL-TIME HOMEMAKER		3.4
2. UNEMPLOYED	1.5	5. STUDENT		.4
3. RETIRED	26.7	6. OTHER		1.9

Q-45   What is your occupation?

JOB_____

Q-46   What was the approximate annual gross income (before taxes) received last year by you and adult (18 years or older) family members living with you? (circle number)

		%						
1.	UNDER $5,000	1.2	6.	$25,000-29,999	10.3	11.	$60,000-69,999	8.7
2.	$5,000- 9,999	2.5	7.	$30,000-34,999	8.7	12.	$70,000-79,999	2.5
3.	$10,000-14,999	5.8	8.	$35,000-39,999	8.7	13.	$80,000-89,999	2.1
4.	$15,000-19,999	5.8	9.	$40,000-49,999	16.1	14.	$90,000-100,000	1.2
5.	$20,000-24,999	8.7	10.	$50,000-59,999	12.4	15.	MORE THAN $100,000	5.0

Q-47   About how many total hours per week do you and other adult members of your household spend working?

_____ HOURS   mean: 50.49 hours
median: 50   std. dev.: 29.74

Is there anything we may have overlooked? Please use this space for any additional comments you would like to make concerning the quality of trees in the Angeles and San Bernardino National Forests.

Your contribution to this effort is very greatly appreciated. If you would like a summary of results, please print your name and address on the back of the return envelope (NOT on this questionnaire). We will see that you receive it.

6.4 <u>Telephone Survey</u>

The results of the telephone survey may be found in Table 6-14. The first two questions asked respondents if they had ever visited the Angeles and/or San Bernardino National Forests. Over three-quarters of respondents (78 percent) had been to at least one of the forests in question.

Question 3 asked respondents when their last trip was to or through forested areas of either the Angeles or San Bernardino National forest. Half of respondents had visited one of the forests in the past year, while the mean was 2.5 years.

Question 4 was designed to extract information on specific areas in the National forests where respondents had traveled. Regions near Lake Arrowhead and Big Bear Lake in the San Bernardino National Forest were the areas most frequented.

Question 5 asked respondents what the purpose of their trip was. The majority, 51.3% replied that camping, hiking or other recreation was their main purpose, this was followed by traveling to some place other than the national forest (20.5%).

Question 6 asked telephone respondents how much time they spent in the forested areas of the National Forests on their last trip. The mean was 1.6 days.

Question 7 centered upon the respondents' decrease in enjoyment of the forest as a result of injured trees. At least 36.9 percent of respondents felt that their enjoyment was decreased to some extent as a result of injured trees.

Question 8 asked respondents how often they make trips to the Angeles or San Bernardino National Forests. The mean response to this question was 5 trips per year.

Questions 9 through 12 gathered socio-demographic information about the respondents and their families. These results are summarized in Table 6-15

The next two chapters present a detailed analysis of property values and contingent values respectively.

TABLE 6-14

Ql : Have respondents ever visited or traveled through the Angeles National Forest?

	%
Yes	52.0
No	48.0

Q2: Have respondents ever visited or traveled through the San Bernardino National Forest?

	%
Yes	76.0
No	24.0

Q5: What was the purpose of respondents last trip?

	%
Sightseeing	19.2
Camping, hiking or other recreation	51.3
Traveling to a non-forest destination.	20.5
Other	9.0

Q6: About how much time did respondents spend in the forested areas of the National Forests on their last trip?

Mean (Days)   1.6

Q7: How did injury affect respondents' enjoyment on last visit to the forest?

	%
Greatly	1.8
Somewhat	21.1
Not at all	14.0
Did not notice	26.9
missing	63.2

Q8: How often do respondents make trips to the forests?

Mean	5	trips/year
Median	1.0	trips/year

TABLE 6-15

Socio-Demographic Characteristics - telephone Survey

<u>Question 9</u>

<u>Age Total Population</u>	<u>%</u>
Under 30	11.8
30 - 60	58.1
61-70	16.1
70+	14.0

<u>mean</u>   <u>49.6 years</u>

<u>Question 11</u>

<u>Primary Language in Household</u>

	<u>%</u>
English	97.0
Spanish	2.0
Other	1.0

<u>Question 12</u>

<u>Income</u>	<u>%</u>	
Under 20,000	9.3	
20,000-40,000	38.7	
40,000-60,000	37.3	
60,000-80,000	10.7	
80,000 +	4.0	
# of refusals		25

Sex	<u>%</u>
Male	60.0
Female	40.0

7.0 PROPERTY VALUE ANALYSIS

7.l <u>**Introduction**</u>

Analysis of property values had long been used to infer implicit values for changes in natural resource characteristics at a site. This section employs residential property value sales data in a hedonic price function to reveal marginal willingness to pay values for small changes in tree quality in the San Bernardino National Forest. These marginal willingness to pay estimates conceptually correspond to the marginal willingness to pay estimates derived from the contingent valuation approach.

7.2 <u>**The Hedonic Property Value Approach**</u>

This section very briefly overviews the hedonic property value approach as applied to valuing environmental and resource characteristics of residential properties. The literature on this topic is extensive and complex. Our purpose is solely to highlight the conceptual foundation for, and issues of, the approach taken herein. For an extensive review of the approach see Bartik and Smith (1987), Freeman (1979), Follain and Jimenez (1985).

<u>Choosing Only The First Step In the Two Step Procedure</u>

Rosen (1974) first presented an integrated treatment of the modeling and valuation of implicit characteristics from market data. His treatment presented a two step procedure: the estimation of a hedonic price function, and the estimation of implicit marginal bid and offer functions. A hedonic price function, as applied to housing and neighborhood attributes, relates the sale price of heterogeneous properties to their different levels of characteristics. In this way the relationship focuses upon inferring how a change in the level of a property characteristic affects the property price. This holds true whether it be a structural characteristic such

as number of rooms, or an environmental characteristic such as quality of the neighborhood trees. Therefore, the coefficient on each characteristic reflects the implicit market price for the characteristic at or around the observed levels.

The hedonic price function results from a market equilibrium that has matched diverse demanders and suppliers, each making optimizing decisions subject to their budget constraints. If each demander and supplier is assumed incapable of influencing the market prices, then the hedonic price function is an equilibrium relationship matching the highest bids by purchasers with the lowest offers by sellers. As a result, each individual is ideally paying (or receiving) his respective marginal willingness to pay (to receive) for each attribute of the property at the equilibrium level of the characteristic.

Rosen's second step presented a framework to retrieve the marginal willingness to pay and marginal willingness to offer functions: functions that relate the marginal willingness to pay (receive) per unit to the level of the unit provided. This is useful as the implicit price from the hedonic price function only applies at or around the equilibrium level of the characteristic while the marginal willingness to pay functions can be integrated to derive the consumer surplus for larger changes in provision of the characteristic, or to value changes other than around the current equilibrium level.

Unfortunately, the process for determining the underlying marginal willingness to bid (or offer) functions (analogous to supply and demand functions) "has not proved to be as direct (or simple) as Rosen's original description seemed to imply" (Bartik and Smith, pg. 514). The use of multiple markets and instrumental variables has been attempted and debated

as a means to identify these functions, but may work only under restrictive assumptions (Bartik 1985, Mendelsohn, 1985, Palmquist 1985, Diamond and Smith 1982, Epple 1987, McConnell and Phipps, 1985 and others).   Bartik and Smith summarize by concluding: "Even if the issues associated with identification can be resolved, the best which can be expected from benefit estimates derived from a marginal bid function... is the equivalent of an extremely restricted partial equilibrium measure of an individual's willingness to pay" (page 519).

The analysis herein will only focus upon estimating the first step: the hedonic price function.   This is due to the limitations in obtaining a defensible marginal willingness to pay function and because we will only be examining values for changes in tree quality around the current levels existing in the San Bernardino National Forest.

Issues in Selecting the Functional Form of the Hedonic Price Function

The evidence on the functional form specification of the hedonic price function is quite limited.   Early literature selected functional forms that resulted in desirable functional forms of the second stage marginal willingness to pay functions within the Rosen framework.   As there is considerable issue with the appropriateness of this second phase, and as we will not be estimating the second step functions, these considerations are not of concern here.   Recently, others have attempted to tie assumptions concerning utility functions of buyers and the distribution of characteristics in the market to determine the appropriate functional form for the hedonic price function.   For example, based upon this approach Epple (1987) and Cropper et al. (1985) suggest quadratic hedonic functions, however, these results are based only upon special cases.

Halvorsen and Pollakowski (1981) proposed the use of general flexible functional form techniques to let the data "tell their own story". Unfortunately, Amemiya and Powell (1981) have shown that while this appears attractive, this approach is more sensitive to an inconsistency in the estimate procedure than previously recognized.

As a result, we are left with limited guidance on the appropriate functional form of the hedonic price function. Therefore, in this analysis we focus upon variations on a linear form to simplify the level of alternatives to consider.

7.3 **The Data and Modeling Approach**

<u>Data Sets</u>

Data from 4 sources was collected and merged in the analysis. The specific variable names and definitions are in Table 7-l.

1. Housing Characteristics and Prices. Property sales and characteristics data was collected for 1136 properties in all areas of the San Bernardino National Forest (SBNF) except Idylldale (some variables are missing for some observations so that final sample sizes in the statistical analyses are smaller); Each property's location is identified according to a grid cell location using Thomas Brother Map books.

2. Distance Variables. Taken from site maps and measuring the average distance to the nearest lake and to the intersection of I-10 and I-15 in the valley.

3. Mean Quality Variables of Environmental Amenities-Survey Data. These variables were taken from question Q20 of the residential mail survey administered to local property owners. These responses were averaged for all individuals on a Map page, which covers an area approximately 3 by 3 miles. Where there were sufficient observations, the data was further disaggregated to one-fourth of a map page if that allowed a minimum of 10 observations upon which to

compute the mean for each cell. These values for each variable were then matched to each property sales data record in the corresponding page and cell.

4. Tree Characteristic Variables - Researcher's Subjective Judgment. The research team visually inspected the forests in the entire area covered by the property value analysis and ranked the trees according to the percent of the area at each site that was forested (PF), the percent of trees exceeding approximately 50-60 feet in height (PB), and the degree of visible injury (V1, V2, V3). These variables are a subjective cross comparison with the survey responses. These variables were measured on a .5 by .5 miles basis and matched by location to each property sales data record.

For purposes of statistical analysis, three merged data sets were developed.

1. FULL. This included all properties in the analysis.

2. EAST. This includes only those properties in Big Bear area.

3. WEST. This includes those properties in the areas near Lake Arrowhead, Running Springs and Lake Gregory.

The mean values for all variables for each data set are found in Tables 7A-1 through 7A-3.

<u>Variable Selection</u>

The general form of the model is:

Sales Price = f (housing characteristics, distance variables, site quality variables)

Given there are numerous variables, problems of multicollinearity and variable selection and omission may be significant. To reduce the analysis required, a predefined set of housing variables and distance variables was included in all regressions based upon literature and simple correlations (See variables with "*" in Table 7-1). The housing variables include all physical characteristics of the house plus the area of the house, squared